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(54) Title: **COUNTER CURRENT MIXING REACTOR**

(57) Abstract: A mixing reactor for mixing efficiently streams of fluids of differing densities. In a preferred embodiment, one of the fluids is supercritical water, and the other is an aqueous salt solution. Thus, the reactor enables the production of metal oxide nanoparticles as a continuous process, without any risk of the reactor blocking due to the inefficient mixing inherent in existing reactor designs. Processes for obtaining various metal nanoparticles using this reactor are also claimed as are particles obtainable by these processes.

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